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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TING SONG and VINCENT B. HO

Appeal 2016-006090
Application 12/833,428
Technology Center 3600

JOHNNY A. KUMAR, TERRENCE W. McMILLIN, and JAMES W. DEJMEK, *Administrative Patent Judges*.

KUMAR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection[1] of claims 1–21. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[1] *See* Specification, filed July 9, 2010 ("Spec."); Final Office Action, mailed Mar. 31, 2015 ("Final Rejection"); Appeal Brief, filed Aug. 5, 2015 ("App. Br."); Examiner's Answer, mailed Apr. 1, 2016 ("Answer"); and Reply Brief, filed June 1, 2016 ("Reply Br.").

The Invention

Appellants' invention relates to "[a] system and method for center curve displacement mapping," i.e., "mapping of a deviation of the center curve of the cavity" during an assessment of ventricular wall motion of a patient's heart with suspected or known cardiac disease to provide a direct measure of cardiac function. Spec. ¶¶ 1–2; Abstract.

Claims 1, 15, and 18 are independent claims and are illustrative of the claimed subject matter, as reproduced below:

Independent Claim 1

> 1. A non-transitory computer readable storage medium having stored thereon a computer program comprising instructions, which when executed by a computer, cause the computer to:
>
> obtain a first plurality of images of a region of interest (ROI) containing a cavity, each image comprising an unmasked portion corresponding to an area outside the cavity and a masked portion corresponding to an area within the cavity;
>
> calculate a center curve of the cavity in the unmasked portion in each of the first plurality of images;
>
> calculate a displacement of the center curve in each of the first plurality of images from a reference center curve of the cavity;
>
> plot a map based on the calculated displacements; and
>
> display the map on a display.

Independent Claim 15

> 15. A method comprising:
>
> obtaining a plurality of masked images, each masked image comprising an unmasked portion containing a ventricular chamber and a masked portion corresponding to a region outside the ventricular chamber;

locating by a processor a center curve of the ventricular chamber within the unmasked portion in each of the plurality of masked images;

generating by the processor a map based on a positional relationship of the center curves to a reference center curve of the ventricular chamber, wherein generating the map comprises calculating a magnitude and a direction of displacement of the center curves from the reference center curve; and

displaying the generated map on a display.

Independent Claim 18

18. A non-transitory computer readable storage medium having stored thereon a computer program comprising instructions, which when executed by a computer, cause the computer to:

obtain a plurality of images of a region of interest (ROI) of a patient, each image comprising an unmasked region containing a ventricular cavity and a masked region surrounding the ventricular cavity;

locate a center curve of the ventricular cavity in each of the plurality of images, the central curve postioned [sic] along a central long axis of the unmasked portion;

plot at least one map based on changes in a displacement of each of the center curves relative to a reference center curve; and

display the at least one map to a user.

Rejection

Claims 1–21 are rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

ANALYSIS

We have considered all of Appellants' arguments and any evidence presented. We disagree with Appellants' arguments and we adopt as our own the findings, legal conclusions, and explanations, as set forth in the

Answer (3–4) in response to Appellants' arguments. (App. Br. 4–16; Reply Br. 2–17). We highlight and address specific findings and arguments for emphasis in our analysis below.

Rejection under § 101 of Claims 1–21

Issue: Did the Examiner err in concluding that claims 1–21 are directed to non-statutory subject matter under § 101?[2]

Under 35 U.S.C. § 101, an invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." The Supreme Court, however, has long interpreted § 101 to include an implicit exception: "[l]aws of nature, natural phenomena, and abstract ideas are not patentable." *See, e.g.*, *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014) (quoting *Assoc. for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013) (internal quotation marks omitted)). In *Alice*, the Supreme Court set forth an analytical "framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Id.* at 2355 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1296–97 (2012)).

The first step in that analysis is to determine whether the claims at issue are directed to a patent-ineligible concept, such as an abstract idea. *See Alice*, 134 S. Ct. at 2355. If the claims are directed to a patent-ineligible concept, the second step in that analysis is to "consider the elements of each claim both individually and 'as an ordered combination' to determine

[2] We consider the claims as a whole and give the claim limitations the broadest reasonable interpretation consistent with the Specification. *See In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

whether [there are] additional elements that 'transform the nature of the claim' into a patent-eligible application." *Id.* (quoting *Mayo*, 132 S. Ct. at 1297–98). In other words, the second step is to "search for an 'inventive concept'—i.e., an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.'" *Id.* (brackets in original) (quoting *Mayo*, 132 S. Ct. at 1294).

In rejecting claims 1–21 under 35 U.S.C. § 101, the Examiner finds these claims are directed to an abstract idea of "performing and managing medical imaging" under *Alice* step 1. Final Act. 2. Under *Alice* step 2, the Examiner also finds that:

> [t]he claims do not amount to significantly more than the abstract idea itself such as not being an improvement to the functioning of a computer itself. Also, the computer related claims require no more than a generic computer to perform generic computer functions that are well-understood, routine and conventional activities previously known to the industry
> *Id.*

As to the first step of the *Alice* inquiry, Appellants contend "[t]he machine-or-transformation [MoT] test remains a useful tool in determining patent eligible subject matter and assessing whether a given claim recites an abstract idea." App. Br. 5 (citing *Bilski v. Kappos,* 130 S. Ct. 3218, 3227 (2010). According to Appellants, "the computer and processor elements of independent claims 1, 15, and 18 are sufficiently particular to define a special purpose computer whose involvement implements the steps of the claimed method (in the case of claim 15) and is more than mere extra-solution activity . . . Accordingly, claims 1, 15, and 18 define a particular machine that weighs heavily in favor of the claims not being directed to an

abstract idea." App. Br. 5–6. In the Reply, Appellants further argue "the focus of the claims is on the specific asserted improvement in computer capabilities." Reply Br. 4 (citing *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016). According to Appellants,

> the plain focus of independent claims 1, 15 and 18 is on a *method for measurement of long axis wall motion of a cavity, such as measuring the ventricular wall motion of a heart, as an improved assessment of cardiac function in patients with suspected or known heart disease*….
>
> each of claims 1, 15, and 18, along with the claims depending therefrom, is not directed to an abstract idea within the meaning of *Alice*. Rather, they are directed to a measurement of long axis wall motion of a cavity, such as measuring the ventricular wall motion of a heart, as an improved assessment of cardiac function in patients with suspected or known heart disease.

Reply Br. 4–5.

In other words, Appellants argue, like *Enfish*, "claims are directed to a specific implementation of a solution to a problem in the image processing arts" and, as such, are not directed to an "abstract idea." Reply Br. 6. As to the second step of the *Alice* inquiry, Appellants contend "when the claims are properly analyzed under the [2014 Interim Guidance on Patent Subject Matter Eligibility] guidelines set forth by *Mayo*, claims 1, 15, and 18 constitute patent eligible subject matter because they amount to significantly more than a judicial exception." App. Br. 7–9; Reply Br. 7–9. In particular, Appellants argue claims 1, 15, and 18 are analogous to hypothetical claims of (1) "Example 3" of the guidelines based on *Research Corporation Technologies Inc. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010) (directed to an improvement in digital image processing techniques); and (2) "Example 4" of the guidelines based on *SiRF Technology Inc. v. International Trade Commission*, 601 F.3d 1319 (Fed. Cir. 2010) (directed

to an improvement in GPS technology) and, when taken as whole, are directed to "locating a center curve of ventricular cavity or chamber, calculating a displacement of the center curve, and plotting a map based on the calculated displacements" which are "unconventional as compared to the prior art techniques." App. Br. 7–14; Reply Br. 6–15.

We are not persuaded by Appellants' arguments. At the outset, we note that Appellants' reference to the "machine-or-transformation" test is misplaced. The "machine-or-transformation" test was recognized by the Supreme Court in *Bilski v. Kappos*, 561 U.S. 593 (2010) as a useful tool in determining patent eligible subject matter, but that test was replaced by *Alice*'s two-step framework. In *Alice*, an applicant may not circumvent the prohibition on the patenting of abstract ideas simply by drafting claims to include generic computer hardware. *See Alice*, 134 S. Ct. at 2359 (explaining that allowing claims to a computer system configured to implement an abstract idea "would make the determination of patent eligibility 'depend simply on the draftsman's art,' thereby eviscerating the rule that 'laws of nature, natural phenomena, and abstract ideas are not patentable'") (citations omitted).

As correctly recognized by the Examiner, Appellants' claims 1–21, when considered in light of the Specification, are directed to an abstract idea of "performing and managing medical imaging" under *Alice* step 1. Final Act. 2. As further recognized by the Examiner, "Appellants' claims merely recite using original images as data input from which to derive said center curve, and create or plot a map using said derived curve." Ans. 3. All the steps recited in Appellants' claims 1, 15, and 18 can also be considered as a series of *mental steps* or "mental processes." *See Gottschalk v. Benson*, 409

U.S. 63 (1972). All the steps recited in claims 1, 15, and 18, including: (1) obtaining a plurality of masked images, (2) locating a center curve of the ventricular chamber, (3) generating by the processor a map, and (4) displaying the map, can also be performed by a human using pen and paper. Ans. 3; *see CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed. Cir. 2011) ("That purely mental processes can be unpatentable, even when performed by a computer, was precisely the holding of the Supreme Court in *Gottschalk v. Benson*"). "[A] method that can be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101." (*Id.* at 1373). For example, the recited steps of (i) "obtain[ing] a first plurality of images of a region of interest (ROI) containing a cavity," (ii) "calculat[ing] a center curve of the cavity in the unmasked portion in each of the first plurality of images;" and (iii) "calculat[ing] a displacement of the center curve . . . from a reference center curve of the cavity;" as recited in claim 1—can be performed by a human who observes a center curve of the cavity and a displacement of the center curve based on images. Likewise, the recited steps of (iv) "plot[ting] a map based on the calculated displacements; and (v) "display[ing] the map on a display" as recited in claim 1—can be performed by a human who sketches a graphical representation based on that data using pen and pencil.

Contrary to Appellants' arguments, the Specification does not describe, and Appellants do not present evidence to establish how any of the steps recited in Appellants' claims 1, 15, and 18 provides a specific improvement to the computer. *See Enfish*, 822 F.3d at 1336. Likewise, Appellants have not demonstrated how these claims "improve the way a computer stores and retrieves data in memory," as the claims in *Enfish* did via a "self-referential

table for a computer database." *See Enfish*, 822 F.3d at 1336, 1337, 1339. In fact, none of the steps recited in Appellants' claims 1, 15, and 18 provides, and nowhere in the Specification can we find, any description or explanation as to how these steps are intended to provide: (1) a "solution . . . necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks," as explained by the Federal Circuit in *DDR Holdings, LLC v. Hotels.com, L.P.,* 773 F.3d 1245, 1257 (Fed. Cir. 2014); (2) "a specific improvement to the way computers operate," as explained in *Enfish*, 822 F.3d at 1336; or (3) an "unconventional technological solution . . . to a technological problem" that "improve[s] the performance of the system itself," as explained in *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1306, 1302 (Fed. Cir. 2016).

Turning now to the second step of the *Alice* inquiry, we find nothing in claims 1, 15, and 18 that adds anything "significantly more" to transform the abstract concept of "performing and managing medical imaging" into a patent-eligible application. *Alice*, 134 S. Ct. at 2357. Appellants do not argue any of the steps recited in claims 1, 15, and 18 is individually inventive. Nor do Appellants argue the ordered combination of these elements is inventive. App. Br. 7–14. Instead, Appellants' claims 1, 15, and 18 simply incorporate a general-purpose computer and "memory medium" to perform the abstract concept of "performing and managing medical imaging" i.e., "obtaining, calculating a center curve and a displacement, and plotting/displaying a map of displacements."

To the extent that *Bilski's* "machine-or-transformation" test may be applicable, such a test can only be "useful" in the second step of the *Alice* inquiry. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715–16 (Fed. Cir.

2014). However, limiting the abstract concept of "obtaining, calculating a center curve and a displacement, and plotting/displaying a map of displacements" to a general purpose computer as recited in Appellant's claims 1, 15, and 18, does not transform the abstract idea into a patent eligible invention under 35 U.S.C. § 101. Ans. 4. As recognized by the Supreme Court, "the mere recitation of a generic computer cannot transform a patent ineligible abstract idea into a patent-eligible invention." *See Alice*, 134 S. Ct. at 2358, 2359 (concluding claims "simply instruct[ing] the practitioner to implement the abstract idea of intermediated settlement on a generic computer" are not patent eligible); *see also Ultramercial, Inc. v. Hulu, LLC,* 772 F.3d 709, 715–16 (Fed. Cir. 2014) (concluding claims merely reciting abstract idea of using advertising as currency as applied to particular technological environment of the Internet are not patent eligible); *Accenture Glob. Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1344–45 (Fed. Cir. 2013) (concluding claims reciting "generalized software components arranged to implement an abstract concept [of generating insurance-policy-related tasks based on rules to be completed upon the occurrence of an event] on a computer" are not patent eligible); *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1333–34 (Fed. Cir. 2012) ("[s]imply adding a 'computer aided' limitation to a claim covering an abstract concept, without more, is insufficient to render [a] claim patent eligible").

More importantly, Appellants' reliance on: (1) "Example 3" of the guidelines based on *Research Corporation Technologies Inc. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010) (*RCT*); and (2) "Example 4" of the guidelines based on *SiRF Technology Inc. v. International Trade Commission*, 601 F.3d 1319 (Fed. Cir. 2010) (*SiRF*) is also misplaced. In *RCT* and *SiRF*,

the claims are directed to an improvement in digital image processing techniques or GPS technologies. In contrast to *RCT* and *SiRF*, Appellants' claims 1, 15, and 18, when taken as whole, are directed to "locating a center curve of ventricular cavity or chamber, calculating a displacement of the center curve, and plotting a map based on the calculated displacements"—all mental steps or steps performed by a human using pen and paper. Moreover, the steps recited in Appellants' claims 1, 15, and 18 are not directed to any "specific improvement to the way computers operate," as explained in *Enfish*, 822 F.3d at 1336; and do not provide any "unconventional technological solution . . . to a technological problem" that "improve[s] the performance of the system itself," as explained in *Amdocs*, 841 F.3d at 1302.

Lastly, Appellants argue "[c]laims 1–21 are not an attempt to tie up the use of mathematical relationships." Reply Br. 16–17. That argument is insufficient to show error because, although "preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015). Moreover, where, as here, "a patent's claims are deemed only to disclose patent ineligible subject matter under the [*Alice*] framework . . . preemption concerns are fully addressed and made moot." *Id.*

Because Appellants' claims 1–21 are directed to a patent-ineligible abstract concept and do not recite something "significantly more" under the second prong of the *Alice* analysis, we sustain the Examiner's rejection of these claims under 35 U.S.C. § 101 as being directed to non-statutory subject matter in light of *Alice* and its progeny.

DECISION

We affirm the Examiner's decision rejecting claims 1–21 under 35 U.S.C. § 101.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 41.50(f).

AFFIRMED